7-2004

Singapore's Foray into Bangalore, India: An Empirical Review

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Singapore's regionalization stratagem led to the establishment of industrial parks in China, India and several South-East Asian countries. The strategic intent behind these overseas projects was two-fold: exporting Singapore's competencies such as management know-how, technological capabilities and corrupt-free administration to regions where such positive factors were lacking and secondly, exploiting comparative advantages that each region had to offer. This paper investigates Singapore's foray into India, through the technology park in Bangalore. It evaluates the location-specific benefits of the site, primarily in terms of abundant and low-cost labor resources. Accompanied by empirical findings, this study finds that, while location-specific merits abound, much of these have not translated into direct benefits for Singapore, largely due to socio-political problems that continue to plague the host environment.

Despite its resource-constrained domestic environment, Singapore has achieved significant economic growth by focusing on its core-competencies. Singapore's infrastructural abilities, technological know-how and favourable reputation among foreign companies, coupled with its constant economic reform programs played a significant role in attracting foreign direct investment into the city-state. Such a move started as early as the mid-1960s which saw the beginnings of the Singapore government's aggressive approach to woo foreign MNCs to fuel the city-state's economic development (Chia, 1986; Pang, 1987). However, while much of Singapore's initial growth relied upon such inflow of foreign investment, a reversal of trend was being observed by the mid 1980s. Rapid economic growth and liberalization of foreign investment controls in the Asian region presented Singapore with foreign investment opportunities for developing its external economy, locally known as the 'second wing'. This second wing offered immense opportunities in the form of location-specific resource advantages that were either limited or totally absent in the city-state. Singapore sought to counter is own resource-deficient status by leveraging on such advantageous economic resources of neighbouring countries.

The regionalization program saw the establishment of industrial parks in the region that simulated a 'Singapore-styled' business environment in the emerging economies (Perry and Yeoh, 2000; Sitathan, 2002). Regionalization was intended to create economic space for local and Singapore-based multinationals to redistribute their resource-dependent operations, and to upgrade their operations in Singapore to higher-end activities, utilizing the unique set of benefits and competencies offered by each location. It was envisaged that these industrial parks would enhance the competitiveness of Singapore-based companies that redistribute particular operations to reap location advantages from the regional sites. This not only enhances the cost-competitiveness of firms, but develops Singapore into a high-value investment hub with strategic linkages to resource-abundant locations in the region. To augment the location advantages of the strategic sites, Singapore lends its reputation and competitive strengths in infrastructural development and management to the regional sites.

Against this backdrop, this paper explores Singapore's move into India with the establishment of the International Tech Park Limited in Bangalore. It seeks to determine the extent to which the park has managed to achieve the 'regionalization' objectives in terms if reaping location-specific advantages and the successful exportation of Singapore's strengths to the park.

To provide the context for this discussion, the theoretical considerations underpinning the project in Bangalore are sketched in the next section. The theories primarily include Dunning's Investment Development Path (IDP) and the Eclectic Paradigm which corroborate Singapore's recent economic move of directing investments outwards, into parks abroad. The subsequent section takes a closer look at the progress of the International Technology Park Limited (ITPL), and examines the challenges confronting this flagship project. The analyses are further reinforced by our survey results and in-depth case studies of the Park's tenants. The final section considers the implications of the new evidence on Singapore's broader regionalization initiative.

Theoretical Considerations

Dunning's Investment Development Path

Singapore's move towards regions outside its shores accompanied by heavy outward foreign direct investment, after being at the receiving end of substantial foreign investment into the country for more than two decades can be explained by Dunning's Investment Development Path (IDP). Dunning (1981) and Dunning & Narula (1996) argue that a country's net outward investment (NOI, outward FDI minus inward FDI) is systematically related to its economic development. The IDP conceptualises a U-shaped relation between economic development and a county's net outward investment position.

As economic development takes place, net inward direct investment will first grow and then decline. In the earliest phase of such inward capital flows, a country's infrastructure will be inadequate to support such inward investment. However, such investment will not only be supported but will continue to increase as economic growth occurs. A parallel can be drawn between the above description and Singapore's developmental period during its first two decades of existence (from the mid-1960s to the mid-1980s). The city-state experienced a similar increase in inward investments with an increasing growth rate. In fact, its long-established stratagem of economic development through foreign direct investments is well documented (Chia, 1986, Pang, 1987).

Dunning also states that such inward investment will help create firm-specific assets that would allow outward direct investment. However, in backward regions it will take longer to accumulate such assets in order to initiate any kind of outward capital flow (Dunning, 1988; Caves, 1996). Over time, learning-by-doing will cause this process to evolve and outward FDI will emerge. Invariably, with the reversal of trend propelling investments outward, the country will experience an erosion of its comparative cost competitiveness, thus reducing the incentive for inward investment and further increasing the incentive for outward investment. The scenario in Singapore followed the same trend with rising business costs in the mid-1980s crippling the island and diminishing its cost competitiveness. However, with the city-state becoming wealthier it looked to channel its financial resources in the form of outward investments in order to retain its competitiveness. Such a move manifested in its regionalization strategy.

The Eclectic Paradigm

The subsequent and inevitable outward investment of any growing economy aims to procure, among other benefits, location-specific advantages in the host country, for the investing country. Dunning's IDP characterises economic development with the net outward investment position of the country and correlates government policy with economic development in determining the pattern of competitive advantages of foreign investors relative to those of local firms (ownership advantages or the O-advantage), relative competitiveness of local bound resources and capability of the country (location advantages, or the L-advantage), and the propensity of foreign and local firms to utilise the ownership advantages internally rather than through markets (internalisation advantages, or the I-advantage). Dunning's Eclectic Paradigm explains the above OLI model.

According to Eclectic Paradigm, foreign investment will occur only if it is advantageous to combine spatially transferable intermediate products produced in the home country, with at least some immobile factor endowments or other intermediate products in another country (Dunning, 1988). Simply put, the OLI-model must be satisfied. In other words, there needs to be a balance between the three criteria. Dunning goes so far as to comment that the OLI triad of variables may be likened to a three-legged stool, each leg supportive of the other and the stool is only functional if the three legs are evenly balanced (Dunning, 1998). In so far as the third leg completes this balancing it may be regarded as the most important. Given such a diagnosis, what comes across clearly is how the location-specific advantages associated with the Indian venture form the third leg of the stool, being the single-most important reason for Singapore's foray into India.

Traditional location theories dealt with asset-exploring activities which were designed to maximize the firms' current efficiency whilst identifying the transaction costs and benefits of neighbouring activities. Contemporary theories postulate that in locating their activities within a limited spatial area, firms maximize the benefits of dynamic learning economies at the same time minimizing transaction costs associated with space (Dunning, 2000a, 2000b). Firms' strategic choice of location reflects twin aims; to not only transfer their resources to the host countries, but gain access to the available strategic assets as well (Dunning, 1995; Porter, 1994, 1996; Makino and Delios, 1996; Chen and Chen, 1999; Frost, 2001).

Regionalization: Establishment of the Indian Presence

The regionalization endeavour witnessed the growth of Singaporean industrial parks in numerous countries such as Indonesia, China, Vietnam and India. However, this paper will focus on the latest regionalization venture in Bangalore, India. The move into India was initiated in 1994 and the timing could not have been better. The early 1990s saw India throwing her doors open to foreign investment as part of a determined liberalization procedure in order to boost economic growth, akin to what Singapore had done in its early years of development. Singapore's response was positive and led to the setting up of the International

Technology Park (ITPL) in Bangalore, the country's IT capital.

India put forward numerous location specific advantages which prompted Singapore to set up an industrial park in Bangalore. The cheap and plenteous availability of both skilled and unskilled labor, the abundant land resources, espoused with the cooperative and encouraging attitude of the Indian government would definitely translate into a myriad of advantages for the city-state, if it were to relocate some of its operations in India. The Singapore government not only recognised this golden opportunity, but saw something more in an Indian park than it had seen in some of its already established parks. The information technology boom accompanied by the vast disposal of IT facilities and highly-skilled software specialists presented Singapore an avenue for building a technology park wherein high-end activities could take place. Hence, while other parks engage primarily in manufacturing or "operations" activities, ITPL has provided Singapore with the unique set of advantages that blends low-cost and high-end activities at the same time.

The next section of the paper delves further into ITPL, giving a description of its functioning and characteristics.

International Technology Park Limited

Based on the perception that Singapore agencies have advantages in infrastructural development, ITPL was initiated as a real estate development in India.

The idea was mooted by Singapore's Prime Minister Goh Chok Tong and India's Premier, P.V. Narasimha Rao, in 1992. Construction commenced in September 1994, and the park was officially inaugurated in 2000.The partners in the ITPL project are a Singapore consortium of companies led by Ascendas International, the Tata Group (India's largest business conglomerate) and the Karnataka state government in a 40-40-20 arrangement. The Karnataka state government has since reduced its stake to 6 percent, while the Singapore consortium and the Tata Group have increased their respective stakes to 47 percent each.

ITPL was marketed as an environment that "cuts through the red tape and bottlenecks that are a part of India's infrastructure and operating environment" (*The Straits Times, August 8, 1999*). ITPL was slated to provide total business space solutions to multinationals and other conglomerates, within a state-of-the-art technology park. The park's development consists of 2 phases. Phase 1, which includes the Discoverer, Creator and Innovator blocks, with built-up office, production and retail space, adopts the Singapore-styled, integrated 'work, live and play' concept. ITPL guarantees uninterrupted power supply and telecommunication facilities, immediate-occupancy business incubator space, and the formulaic 'one-stop' service. Phase 2, comprising the Explorer building, a replica of the Innovator, Built-To-Suit (BTS) facilities, is due for completion in early 2004. This phase will add a total area of 350,000 square feet to ITPL's current built-up area of 1.6 million square feet. ITPL also houses the Indian Institute of Information Technology, which provides professional and skilled manpower for the park's tenants.

To-date, there are 100 confirmed tenants, of which 93 are operational with 8500 employees. More than half the tenants are wholly or partially foreign-owned firms, and more than 70 percent are in software development, integrated circuit design, research and development and precision technology. ITPL's tenants include global players like SAP Labs, First Ring, AT&T, IBM, Motorola, Sony, Texas Instruments, Citicorp and Thomas Cook. Operating profits have been registered, and ITPL is projected to break even within the next 4 years.

Empirical Findings

To add the empirical rigor to this paper, we adopted a 2-pronged approach featuring in-depth case studies of selected firms in ITPL and on-site questionnaire survey of a cross-section of firm in ITPL. The next section presents our case studies, while our logit estimations on ITPL (vis-à-vis Singapore's other overseas industrial parks) are set out in the following section.

Case Studies

The companies were selected to reflect ITPL's diversity, and for their considerable presence in the park. The semi-structured interviews were designed to gather information on the push-pull factors that influenced the firms' decision to locate in ITPL. The case studies look to show the extent to which Singapore's objectives have been met with the initiation of the park, from a client perspective. The characteristics of the firms are summarized in Table 1.

Table 1: Summary Information on Case Study Firm

Company	**A**	**B**	**C**	**D**
Country	Japan	U.S.A.	U.K.	Germany
Sector	Manufacturing Services	Business Process Outsourcing	Travel & Financial Services	Inter-Enterprise Software
No. Of Employees at ITPL	50 - 100	800	5	500
Space Occupancy (sq. feet)	-	60,000	-	100,000

Source: ITPL, Bangalore

Case A– manufacturing services Based in Japan and specializing in the production of machine tools, Company A is considered one of the largest machining centres in Asia. The company has centres in some of the major

countries around the world such as Germany, US, China, Brazil and Mexico, with its strongest presence in Singapore and Japan.

Located at the Export Promotional Zone, the company's activities within the park largely entail marketing services and application, light machining and unit assembly which continue to serve as essential support functions for the parent company.

The company's choice to relocate at ITPL was driven primarily by the infrastructural advantages and quality assurance promised by the 'Singapore Park". Prior to ITPL, the company's operations in Bangalore were conducted from a small office in Jayanagar, which began as early as 1994. However, when ITPL opened in 1997, the company made a swift movement, recognising the park's potential, to be one of the first tenants of the park. The company also boasts of the status of being the first and only manufacturing company located at the park. An occupant at the Creator building of the park, the company's manufacturing was restricted to customer demonstrations and unit assembly functions.

Nearing five years of operations in ITPL, Company A vacated its ITPL location and moved into its new complex within the Export Promotional Zone, in close proximity to ITPL in 2002. The company cited the need for a cheaper and larger area (10 – 15 hectares) as the reason behind its departure. While the park proffered numerous benefits, it failed to meet the requirements of large-scale and fast-growing manufacturing concern like company A. ITPL proved to be space-restrictive and expensive

ITPL rents are considered extremely high for manufacturing units, and are just about manageable for short incumbent periods for larger companies such as Company A. This is because such companies operate on low margins (approximately 10%) and require large amounts of space. Hence, when the park no longer proved to be suitable for the company, it decided to move out.

Case B –business process outsourcing Company B, a US-based firm is in the business of providing e-services. With its headquarters in Los Gatos, California and operations at ITPL, the company is looked upon as an industry standard provider in customer support services and solutions to Global 500 companies.

ITPL is highly suited for the company's operations. With its facilities catering to small and medium enterprises engaged in R&D and the service sector, the park has become a nesting ground for a large number of firms involved in Business Process Outsourcing (BPO). Located at the 'Creator' building of ITPL, company B is one of many such companies.

Its areas of operations in the park extend to real-time customer service management and the provision of technical support to foreign firms. In fact, the facility in ITPL is the largest call centre in the state of Karnataka. With the likes of Altavista as its customers, the company's chief activities include implementation of successful programs such as outbound telemarketing inbound phone customer service, inbound phone technical service, with service areas spanning countries worldwide, particularly in the U.S and Europe.

Conducting global services primarily through one-on-one telephone services and web based customer assistance, 24-hour connectivity is an indispensable requirement for the company that the park successfully meets. It is on the combination of such factors – the uninterrupted power supply, the 24-hour speedy connectivity and the plug and play services of ITPL – that the unique selling proposition of the park rests, and, this goes a long way in attracting a myriad of companies in the BPO industry.

Moreover, the city of Bangalore has to its credit a multitude of excellent schools and universities wherein a high standard of education is maintained. This serves as an added advantage in that, such institutions have become a constant source of supply of English speaking graduates for the call centres located in the park. Company B, too, makes immense use of this pool of supply of potential employees.

Case C – travel and financial services Recognised worldwide as a leading travel and financial services group, Company C caters to 20 million customers a year. It provides services at 4,500 locations in more than 100 countries and employs over 20,000 people.

Its history in India dates back all the way to 1881, and, today, the company's Indian subsidiary has a network of 54 locations in 16 cities across India and is the largest travel and financial services group in the country. Its core competency lies in foreign exchange, corporate travel, leisure holidays, travel insurance and credit cards.

The company prides itself on the fact that it was one the few companies that was approached by the ITPL management itself to set up shop at the park. On the management's behest, the company acquired an office within the park's premises largely to provide money-changing activity. Its core operations within the park, therefore, include ticketing and foreign exchange services.

The company, within the park, has a small presence in terms of employees and office space. It operates with only 5 employees. However, it has managed to secure a large customer base largely due to the fact that it is the only tenant providing such services within the park. Moreover, the company also caters to an increasing number of firms outside the park who find it convenient to visit its office in the park, which is in close proximity, instead of approaching its other branches placed in the city-centre.

Case D - inter-enterprise software Company D is a 100% subsidiary of its German parent and is a highly reputed software giant. It carries out similar operations as

its German parent, that of providing collaborative business solutions and development of software.

Company officials reveal that before moving into ITPL, the company had considered other city locations which were comparatively cheaper in terms of rentals, offering one-fourth of ITPL's rate. However, ITPL was chosen over the other locales, again, due to attractive benefits it provided in terms of power supply, state-of-the art infrastructure and excellent communication channels.

In fact, the company recognises that the excellent operating facilities have generated an increase in revenue and this increase is larger than the increased costs it has to bear (in terms of rental), thus justifying its move into ITPL. The company primarily undertakes software development activities within the park and functions as a 100% export unit. All its exports go to Germany.

Within 4 years of operations in the park, the company expanded rapidly, growing from a company of 70 employees to 500 employees because of which it was forced to shift out of the park. Ideally suited for small and medium sized enterprises, ITPL could no longer support its fast growing activities. Hence, space constraint was singled out as the key factor for relocation. Moving into a larger and less expensive area would tantamount to additional advantages in the form of economies of scale. Hence, the company chose to reposition itself into an expansive new campus of 15 acres in area within the Export Promotional Zone itself.

Being a global corporate giant, the company was also looking to separate itself in order to establish and reaffirm its identity. It had been deprived of such an opportunity in multi-tenanted park like ITPL. However, given ITPL's unique advantages and the image and branding associated with it, Company D has retained some office space in the park's new BTS (Built-To-Suit) facilities.

Questionnaire Survey

Questionnaire surveys were conducted in three of Singapore's industrial parks, in Indonesia, Vietnam, and India, from December 2002 to June 2003. A total of 83 responses were collected from industrial park tenants. Of these, 27 were located in Batamindo Industrial Park (BIP) in Indonesia, 23 were located in the Vietnam-Singapore Industrial Park (VSIP) in Vietnam, and the remaining 33 were located in ITPL.

The surveys sought to highlight the different push/pull factors facing the park tenants when they chose to relocate their operations to the respective parks, and the operating constraints faced by the respective park tenants. The survey focused on three main areas. Firstly, the basic profile of the respondent: type of ownership, nature of operations, number of employees, sales turnover and its market orientation. Secondly, the factors that attracted the respondents to invest in the park. Data on various constraints were gathered in the third section.

Apart from analyzing the descriptive statistics and popular rankings on the responses related to the factors and constraints, logit analysis was used to compare the push/pull factors influencing the tenants' decision to locate in the Parks. The logit model, estimated by the maximum likelihood, takes the following form:

$$P_i = \exp(Z_i)/[\,1 + \exp(Z_i)]$$

Where: P_i is the probability of firm being located in the particular park
exp refers to the exponentiation operator, and
Z_i is a linear function of the push/pull factors defined as

$$Z_i = \alpha_0 + \sum_{I=1}^{i=11} \alpha_i F_i$$

where: F_i (1 to 11, depending on the type of push/pull factors) = 1 if constraint *i* is selected, 0 otherwise
α_0 = constant term
α_i = coefficient of independent (explanatory) variable
The "forced entry" method of regression was used.

Estimated coefficients in the logit model, if statistically significant (as indicated by the p-values), would suggest that the firm choosing that particular push/pull factor is more likely to be from ITPL than from other similar industrial parks. For example, if the coefficient of F_1 is *positive* and *significant*, this would suggest that, after taking into account the effects of other push/pull factors, a firm choosing "Political commitment from the Singapore government" has a higher probability of being a firm located in ITPL compared to a firm which did not select this choice as one of their reasons for re-locating, i.e. political commitment from the Singapore government is a significant pulling factor for the ITPL tenants.

The results of the statistical test for push/pull factors are presented in Appendix 1.

A similar logit model was applied to the constraints faced by the parks' tenants:

$$P_i = \exp(Z_i)/[\,1 + \exp(Z_i)]$$

Where: P_i is the probability of firm being located in the particular park
exp refers to the exponentiation operator, and
Z_i is a linear function of the constraints[1] defined as

$$Z_i = \beta_0 + \sum_{I=1}^{i=n} \beta_i C_i$$

where: C_i (1 to n, depending on the type of constraint) = 1 if constraint *i* is selected, 0 otherwise
β_0 = constant term
β_i = coefficient of independent (explanatory) variable

In this case, estimated coefficients in the logit model, if statistically significant, would suggest that the firm choosing that particular constraint is more likely to be from

ITPL than from other similar industrial parks. For example, if the coefficient of C_1 is *positive* and *significant*, this would suggest that, after taking into account the effects of other labor constraints, a firm choosing "Shortage of semi-skilled and skilled labor" has a higher probability of being a firm located in ITPL compared to a firm which did not select this choice as one of the constraints they face, i.e. shortage of semi-skilled and skilled labor is a significant constraint faced by ITPL tenants.

The results of the statistical test for constraints are presented in Appendix 2.

Discussion

It must be noted that ITPL's provision of a large number location-specific advantages can be attributed to the unique style of the park's concept that incorporates both the local Indian advantage as well as the exported Singaporean advantage. Singapore's strategy of lending its expertise in infrastructure development to other countries has achieved some measure of success. Over 81% of ITPL tenants surveyed cited "reliable infrastructure facilities" as a significant pull factor. Companies A, B, and D also highlighted this factor in our semi-structured interviews. However, the estimated logit coefficient for this factor, at $\alpha_5 = 0.704$ is non-significant, indicating that the Singapore-styled infrastructure is also a major pull factor for BIP and VSIP tenants.

Our survey results show that "availability of skilled/educated labor" is a pull factor indicated by 36% of respondents. The cheaper cost of labor is an added bonus to companies which locate here, but is not a deciding factor as indicated by the negative and highly significant α_4 (= -3.620) for "competitive labor costs". Companies like Company B, who operate call centres using a large number of Indian graduates, cited the availability of relatively skilled and well-educated labor as providing them with an edge over call centres in other regions.

India's liberalization policy also provided immense opportunities to such MNCs who were looking to enter the growing and untapped Indian market. 42% of respondents cited investment incentives as a pull factor influencing them to invest in ITPL. These investment incentives improved the viability of tenants penetrating the domestic market or utilizing domestic resources. In fact for company C, which is in the travel and financial service sector, having a large market to cater is key, since it operates on relatively low margins. It cites the vast Indian market as the most attractive factor that led to its establishment in India. Hence, resource-seeking and market-seeking motives act as primary drivers behind the decisions of such MNCs to begin operations in India.

ITPL, being Singapore's latest industrial park, appears to have looked into the constraints faced by tenants from its earlier parks, and incorporated the lessons learnt into the development and management of ITPL. This is reflected by the logit estimations for the major constraints facing ITPL tenants - all of the significant coefficients are negative. However, while India presents lucrative opportunities, numerous problems continue to plague its environment. These include: unreliable infrastructure, extensive red-tapism, corruption and inefficiency that continue to prove to be deterrents to incoming foreign nationals. The reliable infrastructure may have lured many tenants to ITPL, but the resulting high overhead costs to maintain the infrastructure is a constraint highlighted by 45% of the tenants, and the reason Companies A and D cite for shifting their operations out of ITPL. Moreover, the initial government support which served as an attractive factor during the beginning of the venture has diminished. This is indicated in its reduced stake in the project. It is with the objectives to counter such inadequacies that Singapore embarked on the ITPL project. The Singapore side has attained considerable success with ITPL by providing companies, (Indian, Singapore-based, and foreign companies) with infrastructural facilities, technology and efficiency that are characteristic of Singapore's business environment. Hence, ITPL also serves companies in search for efficient-seeking location-specific advantages. Company D perceives this technological and efficiency-based advantage as one that contributes enormously in its software development activities.

Dunning's Eclectic Paradigm has also been extended to deliberations on the presence of immobile clusters of complementary value-added activities (Markusen, 1996) and the transactional benefits of spatial proximity. Dunning (2000a, 2000b) contends that the greater the degree of knowledge intensity of a particular activity, the easier it is for labor to migrate across regions or countries, the lower the distance related costs, and the more firms engage in FDI and alliance-related activities to augment, rather than exploit, their existing assets, then the more likely is it that national and micro regional economies will develop specialized centres of excellence. ITPL is gradually developing into such a specialized centre wherein high-value added activities are taking place. The statistic of more than half the number of tenants in the software and R&D sectors bears testimony to this. As firms' core competencies become increasingly knowledge-intensive the location in which firms locate their production, organization and use of assets emerges as a critical competitive advantage (Dunning, 2000a, 2000b). MNEs continue to seek locations (economic and institutional facilities) that are best utilizing their core competencies (Dunning, 1998).

Conclusion

ITPL proves to be a refreshing change in Singapore's series of overseas investments. It showcases a unique blend of high-value added activities performed at comparatively lower costs. e park has attained considerable success in furnishing Singapore with location-specific advantages. However, as mentioned in the above section, the location

specific advantages don't come without numerous other limitations. Singapore's presence in the park thus goes a long way in eliminating many of these limitations so as to provide companies looking to settle at ITPL with an advantageous location. Hence, it is a combination of the proffered Singaporean experience and country-specific comparative advantages that help to attract corporations to ITPL.

Singapore's Positive Reputation

ITPL's success hinges on the "Singapore-styled design and management" reputation. In a country where corporate image is of immense importance the Singapore presence contributes tremendously in enhancing this image. The city-state is world renowned for its management skills, disciplined efficiency and corruption-free administration. The effects of al these strengths can be seen at ITPL, where considerable premium is placed on the Singapore presence. As a result, the park has successfully leveraged on this reputation of reliable infrastructure to motivate companies to relocate to these areas where such facilities are anomaly. The park has been attracting investors with its formulaic one-stop service within a self-sufficient, self-contained environment, which is unburdened by inefficient administration. For example, ITPL is being used by many tenants to establish their brand-image, as there is prestige associated with being located in, what is locally known as, the "Singapore Park".

India's Location Advantage

ITPL has provided considerable location-specific comparative advantage in terms cheap and plentiful labor. Its contribution also extends to the nature of labor provided that enable high value-added activities within the park, making readily available high-quality software developers and IT personnel, as well as a pool of competent graduates, for various operations within the park. India has been one of the biggest beneficiaries of the global shift of high-wage professional jobs to low-cost countries (Straits Times, August 2003). The supply of qualified, English speaking professionals at lower costs has given the country an edge in wooing foreign companies.

With liberalization efforts favouring the entry of MNCs in India, the government support and the influence of inter-governmental relations cannot be ignored. ITPL shares the characteristic of active government involvement, with the Indian counterparts being the Karnataka state government and the Tata Group, which, though private, is well connected with the authorities. The strategic alliances between Singapore's government-linked companies, and its counterparts in the regional sites, were instrumental in mobilizing the resources to complete these multi-million projects.

Finally it must be noted that the sprouting of numerous other parks not only in India, but also in the vicinity as ITPL – parks such as Software Tech Park and Electronic City – has heightened the competition amongst these parks in trying to attract foreign enterprises. However, ITPL's differentiating factor lies in its Singapore connection which proves to be an important marketing edge over technology parks in the country.

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Appendix 1

Table 2: Factors Influencing the Respondents' Decisions to Invest in ITPL (by Popular Rankings and Maximum Likelihood Estimates - Binary Logit) [ψ, ϕ]

Variables	*Frequency*	*Rank*	α_i	*p-value*
Political commitment from the Singapore government	6	4	-0.188	0.821
Political commitment from the Indian government	6	4	-1.048	0.126
Investment incentives	14	2	-0.398	0.558
Competitive labor costs	1	6	-3.620	0.001*
Reliable infrastructure facilities	27	1	0.704	0.357
Availability of skilled/educated labor	12	3	-0.091	0.896
Constant (α_0)	N.A.	N.A.	4.178	0.003*

Note: [ψ] Estimated values were taken from "forced entry" regression.

[ϕ] p-values are for 2-tailed tests.

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

n.c. Non-convergence

Appendix 2

Table 3: Major Constraints on the Respondents' Operations in ITPL (by Popular Rankings and Maximum Likelihood Estimates - Binary Logit) [ψ, ϕ]

Variables	*Frequency*	*Rank*	β_i	*p-value*
Labor constraints				
Shortage of semi-skilled and skilled labor	3	4	-1.538	0.055***
Shortage of professionals and managers	4	3	-1.618	0.021**
Rising labor costs	7	1	-0.353	0.606
Industrial relations problems	3	4	-1.817	0.022**
Others	6	2	-0.235	0.753
Constant (β_0)	N.A.	N.A.	4.758	0.001*
Organizational and Technological constraints				
Difficulty in obtaining capital equipment	2	5	-1.081	0.170
Difficulty in introducing new technology and techniques	3	3	-1.454	0.049**
Lack of good supporting services	3	3	-1.289	0.057***
Difficulty in securing funds for expansion	2	5	-0.672	0.479
High and/or rising overhead costs	15	1	0.533	0.382
Others	4	2	-0.297	0.736
Constant (β_0)	N.A.	N.A.	4.246	0.024**
Environmental constraints				
Impact of host government regulations	7	1	-1.353	0.030**
Competition from overseas industry competitors	4	3	-2.137	0.001*
Others	6	2	-0.360	0.632
Constant (β_0)	N.A.	N.A.	2.989	0.003*

Note: [ψ] Estimated values were taken from "forced entry" regression.

[ϕ] p-values are for 2-tailed tests.

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

n.c. Non-convergence

Source: Questionnaire survey